



RCRV Project Update for UNOLS Council

Clare Reimers, RCRV Project Scientist, 17 April 2024





Project Summary



- NSF MREFC program to build three vessels for coastal oceanography centered along U.S. West, East, and Gulf Coasts.
- Oregon State University Lead Institution overseeing design→transition to operations, and selected operator for west coast vessel, *R/V Taani*
- East Coast Oceanographic Consortium led by URI will operate Vessel 2, *R/V Narragansett Dawn*
- Gulf Caribbean Oceanographic Consortium led by USM and LUMCON will operate *R/V Gilbert R. Mason*

RCRV Team:

Demian Bailey: Project Manager

Clare Reimers: Project Scientist

John Comar: Shipyard Representative

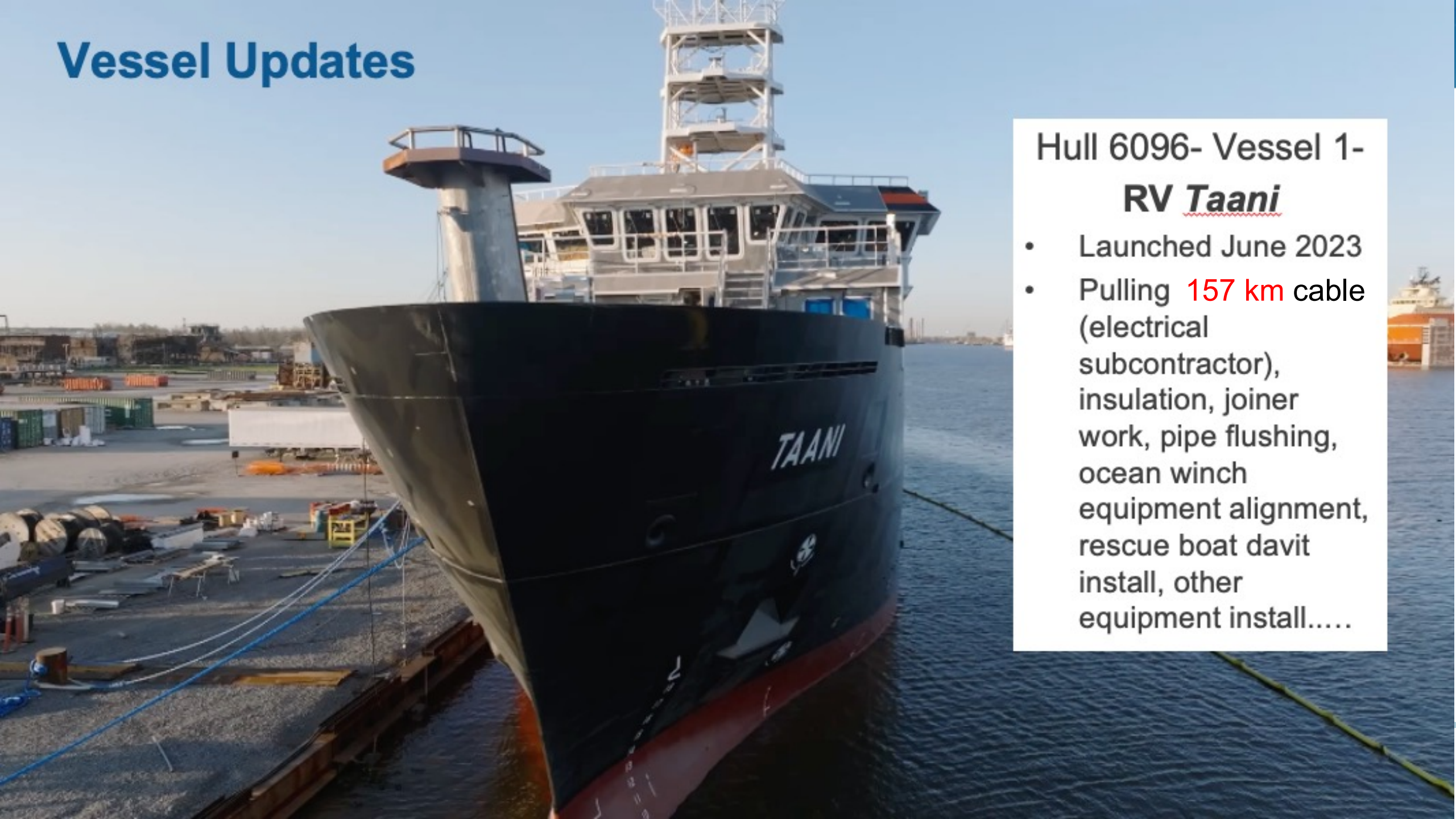
Daryl Swensen: Transition to Operations Coordinator

Kristin Beem: Marine Science Technical Director



2022 Shipyard Tour for FIC

Vessel Updates



Hull 6096- Vessel 1- **RV Taani**

- Launched June 2023
- Pulling **157 km** cable (electrical subcontractor), insulation, joiner work, pipe flushing, ocean winch equipment alignment, rescue boat davit install, other equipment install.....

Vessel Updates

- Hull 6097- Vessel 2
- ***RV Narragansett Dawn***
 - Erection of Aluminum Superstructure!
 - finishing sonar flat and z-drive installations.

Lessons learned from V1 aiding its progress

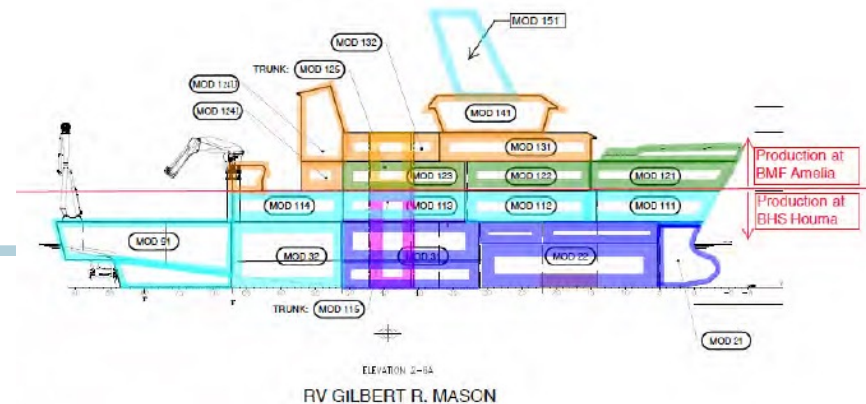
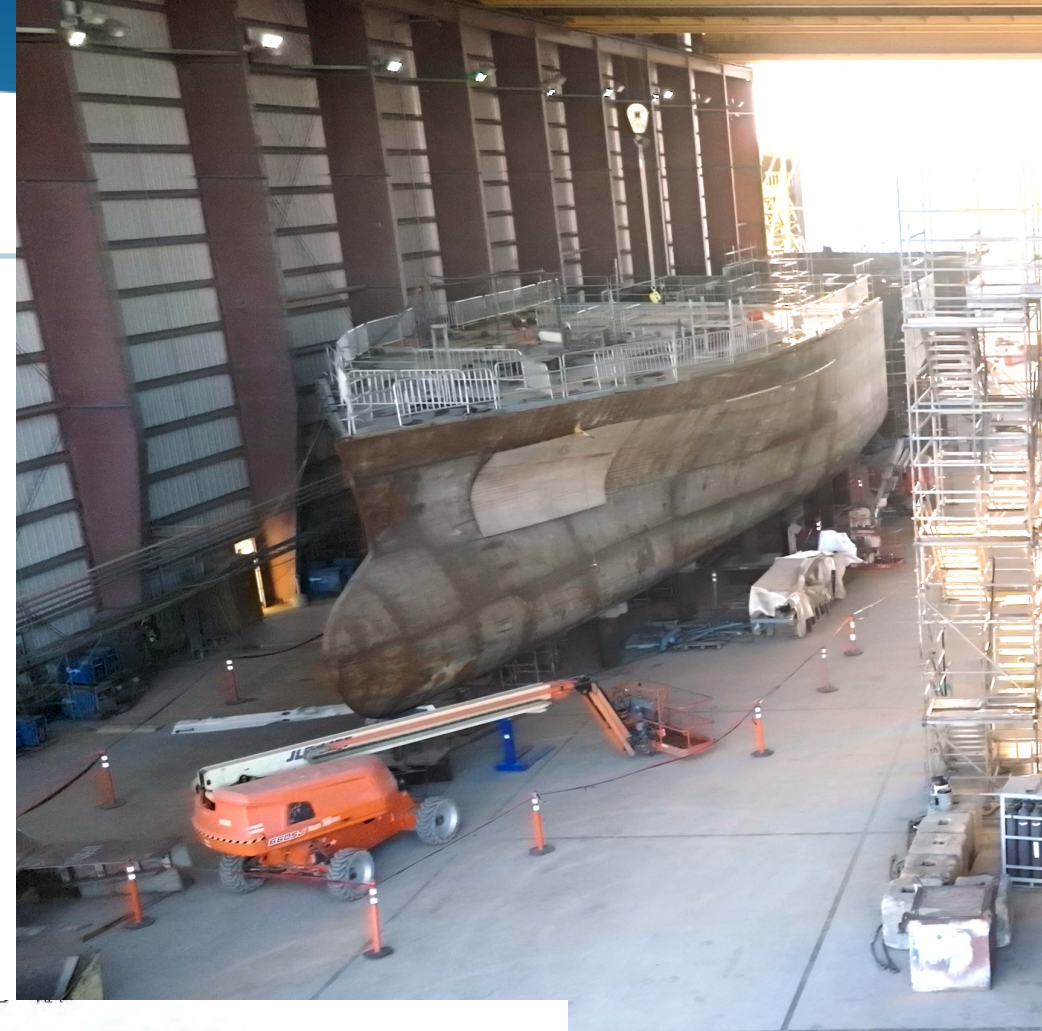




Vessel Updates

Hull 6098 - Vessel 3- *RV Gilbert R. Mason*

- All steel and aluminum modules under construction at various stages.



Remaining Schedule - Taani

- Post-Launch Outfitting (all major ship and science equipment, e.g., crane and A-frame)
- Completion and acceptance of last major Phase IV procurements (e.g., Personnel Van, USBL)
- Commissioning/Shipyard Testing (**7 stages- next 2 slides**)
- Crew Hiring, Orientation and Training
- Dry Dock and Deficiency Closure
- **Delivery – July 2025 BARE but OPERATIONAL BOAT**
- Post-Delivery Outfitting (~\$10M of small equipment and supply items, sensor installations, cyberinfrastructure, furnishing, entertainment system, etc.)
- Operations and Science Trials/Transit to Home Port/Ceremonies
- Warranty Haulout and NSF Inspection
- **Start of Operations- July 2026**



Shipyard Testing – SWBS 092

In our Contract we have **7 Stages of Testing**- There are 22 pages in the contract dedicated to what is required. Project Inspectors Approve Tests.

- Stage 1 – Shop Inspections and Factory Acceptance Tests
- Stage 2 – Construction Inspections and Tests
- Stage 3 – Operation and Performance Tests
- Stage 4 – Dock Trials
- Stage 5 – Builder’s Sea Trials
- Stage 6 – Preliminary Acceptance Trials
- Stage 7 – Special Tests



Deck socket testing V2



Remaining Shipyard Testing before Delivery

- Stage 4 – **Dock Trials**- Also known as Harbor Trials- Propulsion plant spin and load test, bow thruster test, Auxiliary systems testing, lights, navigation, communication, diesel generators, anchor handling,
- Stage 5 – **Builder's Sea Trials**- First time running the vessel out at sea in unconfined waters and making sure all the machinery and propulsion systems are operational. Includes speed, turning, reversal trials and OHS trials. Vessel must be ready and equipped to meet any possible emergency at sea. Personnel provided by shipyard. May have observers.
- Stage 6 – **Preliminary Acceptance Trials**- Further at sea tests to demonstrate the Vessel is ready to be delivered/accepted by the Owner's Representative, tests include thrusters, centerboard, emergency equipment, maneuvering, windlass, navigation, station keeping, etc, etc.
- Stage 7 – **Special Tests**- Noise & Vibration testing/ EM Interference/ Deep water testing 3,500m water depth (Overside Handling Equipment & Science Sonars)



After Delivery: Operations and Science Trials

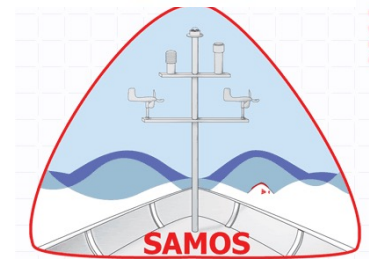
GOALS

- Progressive crew and marine technician familiarization with ship systems in support of multi-disciplinary science.
 - (2-3 extra crew members because of CG regs will limit science berths)
- Complete testing and verification/reporting of vessel systems, science mission equipment, and sensors.
- Demonstration and documentation that the vessel and crew are fine-tuned to do science missions as part of the ARF.
- Collection of scientifically useful data or samples is a **bonus**, will not drive any cruise plan, but we recognize will motivate the support of some experts and more thorough review of data products.



R/V Taani Trials Cruise Sequence (over ~ 8 month period, repeat for V2 and V3)

Trials Cruise	Operations and Science Focus Areas	Days (MOB & Sea)*	Ports	Chief Scientist(s)/ Lead MarTech	Expert Support
Deepwater Trials Leg#1	EM2024 & EM304 patch tests, ADCP speed testing and centerboard position effects, noise monitoring, and sonar performance, bubble sweep-down	12	Gulfport to San Juan, Puerto Rico	Ethan Roth/ Emily Shimada	J. Hummon (ADCP), MAC, J. Beeson, KUTI, MacGregor
Deepwater Trials Leg#2	Deep-water OHS equipment (hydrographic and ocean winches, portable and main A-frames, spooling 6 km, auto features), TOPAS, USBL	8	San Juan to San Juan, Puerto Rico	Ethan Roth/ Emily Shimada	J. Beeson, MacGregor tech, MarTechs
Transit to Homeport	Satellite comms, anti-roll tank tuning, workboat, atmospheric and flow-through sensors, CTD/rosette, <u>datapresence</u> (CORIOLIX)	23	San Juan to Panama City to Newport	Maureen Conte/ Brandon D'Andrea	C. Reimers, C. Romsos, MarTechs
General Operations	Crew training, in port winch spoil swapping, centerboard sensor swap, van integration, crane operations, docking, safety and emergency drills	10	Newport to Newport	William Fanning/ Brandon D'Andrea	Additional Crew and MarTechs
Science #1- Physical	Regional validation and intercalibration of atmospheric and flow-through sensors, ADCP, T-chain towing, dynamic positioning, marine mammal observations	15	Newport to Newport	Jack Barth/ Emily Shimada	NOAA and SAMOS, MMI?
Science #2- Biological	EK-80 validation, towing of different net systems including MOCHNESS, ISIS, sample collection <u>work flow</u> , science freezers and refrigerators, Hazmat, incubator pumps	15	Newport to Newport	Carin Ashjian, Maria Kavanaugh/ Sam Richardson	EK-80 Expert
Science #3- Chemical	Over-boarding of OOI equipment (e.g., AUVs, gliders, small moorings), operate all ship sensors over transects, use lab vans, fume hoods, CTD and discrete sample collections	15	Newport to Newport	Ian Black and Tyler Peterson	J. Fram, OOI Techs, K. Buck
Science #4- Geological	Multiple van integration, maximum science loading, synthetic tension members, PCDRM installation, piston coring, <u>multicoring</u> , multibeam data collection, EM 712 on transducer pole	20	Newport to Newport	Mo Walczak, Jeff Beeson/ Sam Richardson	Allied Technicians, MARSSAM
Science #5- Education & Outreach	Small ROV operations, Telepresence, USBL, Personnel van integration, public tours	10	Newport to Newport	Andrew Thurber, Tracy Crews/ Tyler Peterson	ROV support team, D. Coleman (URI)



*Phase IV Schedule – will be adjusted based on final cruise plans

Testing Categories

Operations: Functionality, arrangement and workflow of all ship spaces and supporting vans; equipment performance.

(Linked to crew training and developing SOPs)

Science Mission Equipment:

- Overboard Handling Systems (OHS)
- Sensors (>60)
 - Underway Meteorological & Flow-Through, CTD
- Integrated Acoustic System- Science Sonars
- Science network, cybersecurity, cameras, communications, displays, CORIOLIX

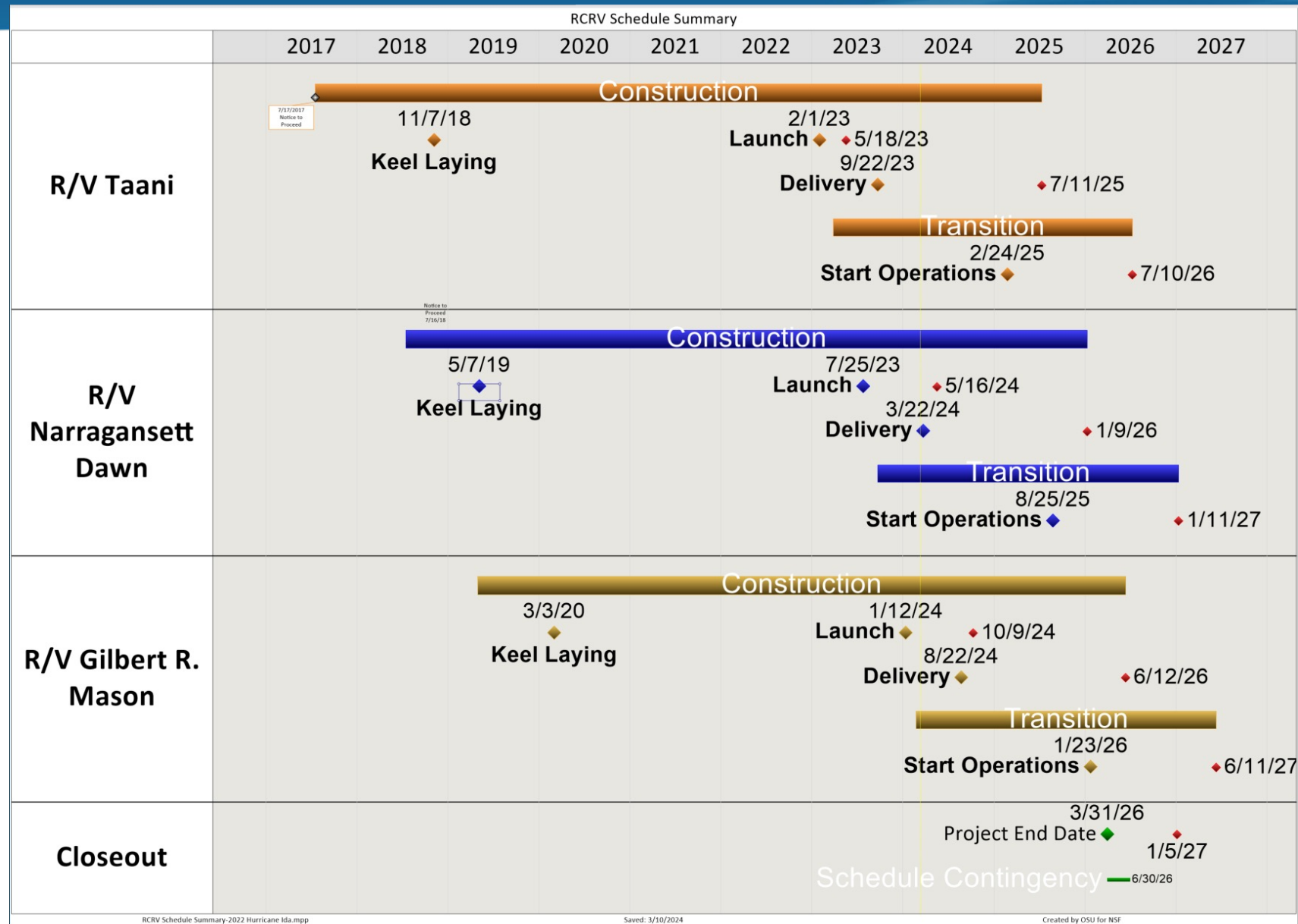




Project's 70% Confidence Projected Schedule

versus BHS contract dates

will result in liquidated damages



RCRV Schedule Summary-2022 Hurricane Ida.mpp Saved: 3/10/2024 Created by OSU for NSF